

## Solar Plasma Variability Observations from the Solar Dynamics Observatory

The launch of the Solar Dynamics Observatory (SDO) in February 2010 allows for continuous observations of the Sun on all times scales from seconds to years. These variations in the solar plasma cause significant deviations in the Earth and space environments on similar time scales, such as affecting the atmospheric densities and composition of particular atoms, molecules, and ions in the atmospheres of the Earth and other planets. Presented and discussed will be examples of initial results using the data from SDO that show how we can trace the origins of solar activity from inside the Sun using different wavelengths, and therefore different temperatures (from 50,000K to 20MK+) that cover the atmosphere and plasma temperature range of the solar atmosphere. The presentation will emphasize how the Solar Dynamics Observatory (SDO), the first satellite in NASA's Living with a Star program, is going to improve upon current observations and provide further insights into the variable Sun and its Heliospheric influence.